REMARKS

A review of the claims indicates that:

A) Claims 1—37 and 39 were cancelled.

B) Claims 38 and 40—42 are previously presented.

C) Claims 43—58 were withdrawn.

The Applicant respectfully traverses the claim rejections, and respectfully requests allowance of the rejected claims.

Restriction

According to the Office Action mailed 08/14/2006 (not the current Office Action) the pending (non-Withdrawn) claims are 38—42. Claim 39 was later cancelled. Accordingly, the Applicant believes that Claims 38 and 40—42 are currently rejected, not Claims 38 and 40—47. The Office Action mailed 02/07/2007 indicated that Claims 38 and 40—47 were rejected. If this was not a typo, the Applicant would appreciate a telephone call, so that this may be sorted out.

Traversal of Rejection of Independent Claim 38

Claims 38 and 40—42 stand rejected under 35 U.S.C. §103(a) as being unpatentable over EP 0 458 481, hereinafter "Leaver." In response, the Applicant respectfully traverses the rejection.

Claim 38 recites, as amended, a coated substrate configured for printing a toner image thereon, comprising comprising:

- **a paper substrate**;
- an underlayer coating, applied directly on the substrate, wherein the underlayer coating comprises amine terminated polyamide; and
- an overlayer coating, applied directly on the underlayer coating, comprising a polymer material to which the toner image can be fused and fixed.

Claim 38 recites, "a paper substrate." This limitation was seen in the Original Claim 5, and was first disclosed in the Specification at page 3, lines 10—12. The Applicant respectfully submits that the Lever reference does not teach or suggest "a paper substrate".

The Lever reference teaches a "polymeric material" on page 2, lines 23—24. Lever teaches that a number of suitable "thermoplastic materials" can be used as the substrate (page 2, lines 27—35). Lever then lists a large number of thermoplastic materials, and indicates that a polyethylene terephthalate film is preferred (page 2, lines 35—38).

Lever teaches that the substrate may comprise a polyarylether or thio analogue (page 2, lines 39—43). Lever also teaches the use of a substrate comprising suitable thermoset resin substrate materials (page 2, lines 44—46). Lever continues to discuss polymeric film substrate at page 2, lines 47—57.

Accordingly, the Applicant submits that Lever teaches and suggests only thermoplastic materials (page 2, lines 27—38), polyarylether and polymers (page 2, lines 39—43), thermoset resins (page 2, lines 44—46), and polymeric film substrates (page 2, lines 47—57). The Applicant respectfully submits that these substances to not teach or suggest the use of a paper substrate as recited.

The Patent Office suggests that Lever discloses:

> "...a coated substrate suitable for printing a toner image thereon comprising a film of sheet made of cellulose (paper), which may also be inclusive of plastic material, such as biaxially oriented

polypropylene (BOPP), polyethylene, polyethylene terepthalate (PET) and polycarbonate (page 2, lines 23—58).

The Applicant would like to start by submitting that the statement, "which may also be inclusive of plastic material, such as biaxially oriented polypropylene (BOPP), polyethylene, polyethylene terepthalate (PET) and polycarbonate" is not relevant, since such materials were not recited in the claims. The issue seems to turn on the question: Is the reference made by Lever to "cellulose ester" (page 2, line 27 and "cellulose acetate" (page 2, lines 27—28) a teaching or suggestion to use paper as the substrate? The Applicant respectfully submits that Lever's disclosure of cellulose ester/acetate does not teach or suggest the use of paper as a substrate in the context of the claim.

1. Lever refers to the cellulose ester and cellulose acetate as "thermoplastic materials," not paper.

Referring to page 2, lines 27—38, and particularly at lines 27—28, Lever refers to "thermoplastic materials", and then proceeds to list a lengthy list of such materials, including "cellulose ester" and "cellulose acetate". Thus, Lever teaches "cellulose ester" and "cellulose acetate" are "thermoplastic materials". Therefore, a plain reading of Lever indicates that Lever does not mean to teach or suggest "paper," since Lever specifically calls the cellulose ester/acetate a "thermoplastic material." In fact, by teaching the use of "thermoplastic materials," Lever teaches away from the use of paper.

Accordingly, the Applicant respectfully submits that Lever does not teach or suggest the use of a paper substrate for the under/over layers, and actively teaches away from paper by stating that the materials cited therein are "thermoplastic materials" (page 2, line 27).

2. Authorities indicate that "cellulose acetate" is not a paper product.

Referring to "answers.com", we see a discussion of "cellulose acetate" that does not refer to paper (see, http://www.answers.com/topic/cellulose-acetate). Please see a printout of this webpage in the appendix of this document. This site reports that cellulose acetate is:

> **cellulose acetate**
> *n.*
>
> Any of several compounds obtained by treating cellulose with acetic anhydride, used in lacquers, photographic film, transparent sheeting, and cigarette filters.

and also,

> **cellulose acetate**
>
> A material of the ester family derived by conversion of cellulose; used in the production of synthetic lacquers, coatings, plastics, and thermal insulation.

Thus, the above-cited Internet reference does not discuss paper when discussing cellulose acetate. In fact, synthetic lacquers, coatings, etc. are mentioned, but paper is not. In view of this disconnect, the Applicant respectfully submits that a disclosure by Lever of cellulose acetate does not teach or suggest the use of paper as the substrate, in the context of the applicant's claims.

3. Discussion in the on-line encyclopedia Wikpedia suggests that cellulose acetate is not paper.

Referring to Wikpedia (http://en.wikipedia.org/wiki/Cellulose_acetate) there is no mention that cellulose acetate is paper or a form of paper. Please see a printout of this webpage in the appendix of this document. In particular, the entire discussion of cellulose acetate was devoid of any reference to paper. Absent a showing of a greater association between cellulose acetate and paper, a disclosure of cellulose acetate and/or ether cannot reasonably be interpreted as a teaching or suggestion of the use of paper.

Accordingly, because a disclosure of cellulose acetate as a printing substrate for the under/over layers recited does not teach or suggest the use of paper, the Lever disclosure does not render obvious the use of paper in the context of the Applicant's recited claim elements.

4. The common ingredient of cellulose between cellulose acetate and paper does not imply that one could be substituted for the other.

As noted above, Lever discloses that cellulose acetate/ester is a "thermoplastic." The differences between plastic and paper are considerable, including both chemistry and surface roughness. No showing has been made that the under-layer of Lever, configured for use with a thermoplastic, could be adapted for use with paper. The Applicant respectfully suggests that it is a non-obvious leap to go from the teachings of cellulose acetate to paper, simply because they both include cellulose. Thus, by disclosing cellulose acetate, Lever does not teach or suggest the use of paper in the context of the claim.

5. Lever's disclosure of cellulose ester/acetate does not teach or suggest the use of a paper substrate.

Therefore, the Applicant submits that the disclosure by the Lever reference does not teach or suggest application of the recited under-layer and over-layer to a paper substrate. Accordingly, the Applicant submits that Lever does not support the Section 103(a) rejection. Accordingly, the Applicant respectfully requests that the Section 103 rejection be removed.

Traversal of Rejection of Claims 40—42

Claims 40—42 depend from Claim 38 and are allowable due to their dependence from an allowable base claim. These claims are also allowable for their own recited features that, in combination with those recited in Claim 38, are not shown and not disclosed in references of record, either singly or in combination with one another.

Conclusion

The Applicant submits that all of the claims are in condition for allowance and respectfully requests that a Notice of Allowability be issued. If the Office's next anticipated action is not the issuance of a Notice of Allowability, the Applicant respectfully requests that the undersigned attorney be contacted for scheduling an interview.

Respectfully Submitted,

Dated: 7-12-07 By: David S. Thompson

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Cellulose acetate

From Wikipedia, the free encyclopedia

Cellulose acetate, first prepared in 1865, is the acetate ester of cellulose. Cellulose acetate is used as a film base in photography, as a component in some adhesives, and as a synthetic fiber; it is also an important material used in dildonics.

Contents

Acetate Fiber and Triacetate Fiber

Acetate and Triacetate are mistakenly referred to as the same fiber; although they are similar, their chemical compounds differ. Triacetate is known as a generic description or primary acetate containing no hydroxyl group. Acetate fiber is known as modified or secondary acetate having a few hydroxyl groups. Triacetate fibers, although no longer produced in the United States, contain a higher ratio of acetate-to-cellulose than do acetate fibers[1].

Cellulose acetate film

Cellulose acetate film was introduced in 1934 as a replacement for the unstable and highly flammable cellulose nitrate film stock that had previously been standard. When exposed to heat, moisture or acids the film base begins to deteriorate to an unusable state, releasing acetic acid with a characteristic vinegary smell, causing the process to be known as "vinegar syndrome." Acetate film stock is still used in some applications, such as camera negative for motion pictures. Since the 1980s polyester film stock (sometimes referred to under Kodak's trade name "ESTAR Base") has become more commonplace, particularly for archival applications. Acetate film was also used as the base for magnetic tape prior to the advent of polyester film.

Cellulose acetate computer tape

Cellulose acetate magnetic tape was introduced by IBM in 1952 for use on their IBM 726 tape drive in the IBM 701 computer. It was much lighter and easier to handle than the metal tape introduced by UNIVAC in 1951 for use on their UNISERVO tape drive in the UNIVAC I computer. A few years later cellulose acetate magnetic tape was replaced by the more stable mylar magnetic tape for use on their IBM 727 tape drive.

Fiber

Cellulose acetate or acetate rayon fiber (1924) is one of the earliest synthetic fibers and is based on cotton or tree pulp cellulose ("biopolymers"). These "cellulosic fibers" have passed their peak as cheap petro-based fibers (nylon and polyester) and have displaced regenerated pulp fibers.

It was invented by two Swiss brothers, Doctors Camille and Henri Dreyfus, who originally began chemical research in a shed behind their father's house in Basel, Switzerland. In 1905, Camille and Henri developed a commercial process to manufacture cellulose acetate. The Dreyfus brothers initially focused on cellulose acetate film, which was then widely used in celluloid plastics and film. By 1913, Camille and Henri's studies and experiments had produced excellent laboratory samples of continuous filament acetate yarn. In 1924, the first commercial acetate filament was spun in the United States and trademarked as Celanese [1] .

Fiber Properties

Acetate is a very valuable manufactured fiber that is low in cost and has good draping qualities. Properties of acetate have promoted it as the "beauty fiber"[1]. Acetate is used in fabrics such as satins, brocades, and taffetas to accentuate luster, body, drape and beauty.

- Hand: soft, smooth, dry, crisp, resilient
- Comfort: breathes, wicks, dries quickly, no static cling
- Drape: linings move with the body linings conform to the garment
- Color: deep brilliant shades with atmospheric dyeing meet colorfastness requirements
- Luster: light reflection creates a signature appearance
- Performance: colorfast to perspiration staining, colorfast to dry cleaning, air and vapor permeable
- Tenacity: weak fiber with breaking tenacity of 1.2 to 1.4 g/d; rapidly loses strength when wet; must be dry cleaned
- Environmentally friendly: made from wood pulp of reforested trees
- Abrasion: poor resistance
- Heat retention: poor thermal retention; no allergenic potential (hypoallergenic)
- Dyeability: (two methods) cross-dying method where yarns of one fiber and those of another fiber are woven into a fabric in a desired pattern; solution-dying method provides excellent color fastness under the effects of sunlight, perspiration, air contaminants and washing [1,2]

Acetate usually requires dry cleaning.

Production

The Federal Trade Commission definition for acetate fiber is "A manufactured fiber in which the fiber-forming substance is cellulose acetate. Where not less than 92 percent of the hydroxyl groups are

acetylated, the term triacetate may be used as a generic description of the fiber."

Acetate is derived from cellulose by deconstructing wood pulp into a purified fluffy white cellulose. The cellulose is then reacted with acetic acid and acetic anhydride in the presence of sulfuric acid. It is then put through a controlled, partial hydrolysis to remove the sulfate and a sufficient number of acetate groups to give the product the desired properties. The anhydroglucose unit is the fundamental repeating structure of cellulose and has three hydroxyl groups which can react to form acetate esters. The most common form of cellulose acetate fiber has an acetate group on approximately two of every three hydroxyls. This cellulose diacetate is known as secondary acetate, or simply as "acetate".

After it is formed, cellulose acetate is dissolved in acetone into a viscose resin for extrusion through spinnerets (which resemble a shower head). As the filaments emerge, the solvent is evaporated in warm air via dry spinning, producing fine cellulose acetate fibers.

First U.S. Commercial Acetate Fiber Production: 1924, Celanese Corporation

Current U.S. Acetate Fiber Producers: Celanese Acetate, Eastman Chemical Company

Production Method

1. Purified cellulose from wood pulp or cotton linters
2. Mixed with glacial acetic acid, acetic anhydride, and a catalyst
3. Aged 20 hours- partial hydrolysis occurs
4. Precipitated as acid-resin flakes
5. Flakes dissolved in acetone
6. Solution is filtered
7. Spinning solution extruded in column of warm air. Solvent recovered
8. Filaments are stretched and wound onto beams, cones, or bobbins ready for use [1]

Trademarks

Trade Names---Manufacturer

- Celanese (forms produced: flake and tow)--*Celanese Acetate
- Celstar--*Celanese Acetate
- Chromspun--*Eastman Chemical Company
- Estron--*Eastman Chemical Company
- MicroSafe--*Celanese Acetate
- Zylonite (often called "Zyl")

** Voridian Company is an operating division of Eastman Chemical Company*

Voridian introduced acetate tow in 1952 and remains a leading manufacturer today. Voridian sells acetate tow under the trademark Estron[5].

Acetate Fiber Characteristics

- cellulosic and thermoplastic

- selective absorption and removal of low levels of certain organic chemicals
- easily bonded with plasticizers, heat, and pressure
- acetate is soluble in many common solvents (especially acetone and other organic solvents) and can be modified to be soluble in alternative solvents, including water
- hydrophilic: acetate wets easily, with good liquid transport and excellent absorption; in textile applications, it provides comfort and absorbency, but also loses strength when wet
- acetate fibers are hypoallergenic
- high surface area
- made from a renewable resource: reforested trees.
- can be composted or incinerated
- can be dyed, however special dyes and pigments are required since acetate does not accept dyes ordinarily used for cotton and rayon (this also allows cross-dyeing)
- resistant to mold and mildew
- easily weakened by strong alkaline solutions and strong oxidizing agents.
- can usually be wet cleaned or dry cleaned and generally does not shrink

Major industrial acetate fiber uses

- Apparel: linings, blouses, dresses, wedding and party attire, home furnishings, draperies, upholstery and slip covers.
- Industrial uses: cigarette filters, ink reservoirs for fiber tip pens.
- High absorbency products: diapers, surgical products, and other filters.
- Toys: the original Lego bricks, made from 1949 to 1963.

History

Acetate was first introduced in 1904, when Camille Dreyfus and his younger brother Henri, did chemical research and development in a shed in their father's garden in Basle, Switzerland. Inasmuch as their father was interested in a chemical factory, his influence was probably a factor in their choice of careers. And since Basle was a center of the dyestuffs industry, it was natural that their first achievement should be the development of synthetic indigo dyes. In search of a field that offers really limitless potentialities, they deliberately selected that of cellulose acetate products, including fibers for textile use. [1]

For five years, the Dreyfus brothers studied and experimented in a logical, systematic manner in Switzerland and France. By 1910, they had perfected acetate lacquers and plastic film and opened a factory in Basle capable of producing about three tons a day. This was largely sold to the celluloid industry in France and Germany, and to Pathe Fréres in Paris for non-flammable motion picture film base. A small but constantly growing amount of acetate lacquer, called "dope", was sold to the expanding aircraft industry to coat the fabric covering wings and fuselage.[1]

After some twenty-odd thousand separate experiments, by 1913, the brothers produced excellent laboratory samples of acetate continuous filament yarn. The outbreak of the First World War postponed completion of development leading to successful commercial production until 1921. The war, of course, necessitated rapid expansion of the Basle factory which terminated its trade with Germany and exclusively supplied the Allied Governments with acetate "dope" for military aircraft.[1]

In November 1914, the British Government invited Dr.Camille Dreyfus to come to England to manufacture acetate "dope". In 1917, the War Department of the United States Government invited Dr.

Dreyfus to establish a similar factory here after the US's entry into war. After about six weeks, a contract was negotiated for sale of acetate "dope" to the War Department and a plant site was sought. Dr. Dreyfus and his associates started construction of the American company at Cumberland, Maryland in 1918, but the war was over before the plant could be completed. The business with the Government was completed in due time, construction of the plant continued, the early nucleus of the management began to assemble, and the organization in England completed development of the first commercially successful acetate textile yarn. In England, in 1912, the British company produced the first commercial cellulose acetate yarn. The yarn was sold primarily for crocheting, trimming, and effect threads and for popular-priced linings.[1]

The first yarn spun in America was on Christmas Day, 1924, at the Cumberland, Maryland Plant. The first yarn was of fair quality, but sales resistance was heavy, and silk associates worked zealously to discredit acetate and discourage its use. Acetate became an enormous success as a fiber for moiré because its thermoplastic quality made the moiré design absolutely permanent. The same characteristic also made permanent pleating a commercial fact for the first time, and gave great style impetus to the whole dress industry.[1]

This was a genuine contribution. The mixing of silk and acetate in fabrics was accomplished at the beginning and almost at once cotton was also blended, thus making possible low-cost fabrics by means of a fiber which then was cheaper than silk or acetate. Today, acetate is blended with silk, cotton, wool, nylon, etc. to give to fabrics an excellent wrinkle recovery, good left, handle, draping quality, quick drying, proper dimensional stability, cross-dye pattern potential, at a very competitive price.[1]

References

1. ^ *a b c d e f* Peter John Turnbull Morris, "The American Synthetic Rubber Research Program", Pennsylvania Press, ISBN 0-8122-8207-8, Full Text Online, page 258

- Kadoph, Sara J. and Ann L. Langford, (2002). "Textiles-Ninth Edition." New Jersey:Person Education, Inc.
- acetateworld
- fibersource
- teonline

See also

- Cellulose triacetate
- Safety film
- Textile

External links

- Australian National library associations working group on preserving acetate collections
- history and properties

Categories: Articles with unsourced statements since February 2007 | All articles with unsourced statements | Acetates | Cellulose | Synthetic fibers

Answers.com™ Search

cellulose acetate

Dictionary

cellulose acetate
n.

Any of several compounds obtained by treating cellulose with acetic anhydride, used in lacquers, photographic film, transparent sheeting, and cigarette filters.

Architecture

cellulose acetate

A material of the ester family derived by conversion of cellulose; used in the production of synthetic lacquers, coatings, plastics, and thermal insulation.

WordNet

Note: click on a word meaning below to see its connections and related words.

The *noun* cellulose acetate has one meaning:

Meaning #1: an ester of acetic acid; used in fibers and fabrics; photographic films and varnishes

Wikipedia

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- fibersource
- teonline

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- Textile

External links

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- history and properties

- Links to external chemical sources